

5202DTM Scanner

2D Omni-Directional Bar Code Scanner



Worth Data®

5202D

2D Bar Code Scanner

USB & Serial Output



www.worthdata.com

Owner's Manual



Warning: This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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PROPOSITION 65 WARNING: This product, its packaging, and/or components may contain chemicals known to the state of California to cause cancer or birth defects or other reproductive harm



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Introduction

Worth Data's LZ520-2D is a versatile bar code reader that can attach to any PC or Mac USB port. It can also be used as an external reader for the Worth Data T7000 series of RF Terminals or T5000 series of TriCoders. The USB keyboard interface provides bar code input data to any host computer program exactly as if the data had been typed at the keyboard, including function and control key support. LZ520-2D reader features include:

- **Bar codes**

The LZ520-2D automatically reads and discriminates between Code 39, Full ASCII Code 39, Interleaved 2 of 5, Industrial 2 of 5, Matrix 2 of 5, Chinese Post Matrix 2 of 5, Codabar, Code 128, EAN-13, EAN-8, UPC (with or without supplements), GS1 DataBar, MSI, Code 93, Code 11, Plessey, S-Code, POSTNET, Intelligent Mail Bar Code, Korean Postal Authority, IATA, Tri-Optic, Telepen, JPN (Customer Bar Code), PDF417, Micro PDF417, Maxi Code, QR Code, Micro QR, Aztec Code, Aztec Runes, Data Matrix, Codablock F and Chinese Sensible Code.

- **PC Attachment**

The LZ520-2D provides an easy-to-use USB keyboard interface for the PC or Mac. Scanned data is displayed on the PC as keyboard data - transparent to the host application. No additional software is required for operation or configuration.

- **TriCoder / Terminal Attachment**

When the LZ520-2D is configured with a serial cable it can be connected to a Worth Data T5000 series TriCoder or T701 series Terminal. The Terminal or TriCoder will need to be configured to supply power and accept data from the external LZ520-2D scanner. Refer to the TriCoder or Terminal manual for more information on using the LZ520-2D scanner with these devices.

- **Configuration is easy**

The LZ520-2D reader is easily configured for your system by scanning a bar coded Setup Menu. Refer to the LZ520-2D Setup Guide for detailed setup information. In most cases, the LZ520-2D will do what you need without any changes to it's configuration.

Chapter 1

Installation

Components of LZ520-2D Reader

In the event the shipping box shows damage on arrival, please note the damage on the carrier's receipt log. Open the box and inspect the contents for damage. If there is visible damage, or if the unit fails to work, contact us with the details of the trouble; we will be happy to send you a replacement.

The contents of your LZ520-2D reader shipment should include the following:

1. An LZ520-2D reader with either USB or serial cable attached.
2. A scanner holder.
3. A Utilities CD-ROM with Manuals & Setup Menus in PDF Format.

• USB Interface (PC and Mac)

The LZ520-2D reader is attached directly to the USB port of the computer. The Windows® or Macintosh® operating systems provide the software required to access the USB port. Data coming from the scanner through the USB port appears as keyboard data in your application. No power supply is required for the USB interface. **Simply plug the USB cable into any available USB port on your PC or powered HUB and the LZ520-2D should power-up and be ready to use in a few seconds. It is not recommended to use non-powered hubs due to the high power requirements of the LZ520-2D.**

• Serial Interface (T5000 TriCoder and T701 Terminal)

The LZ520-2D can be used as an external reader with the Worth Data T5000 series of TriCoders and T701 series of RF Terminals. On the TriCoder, the input device will need to be modified to instruct the T5000 to power up the LZ520-2D reader and input data from the external reader. On the RF Terminal, the prompt will need to be modified to power up the LZ520-2D and input data from the external reader. Refer to the T5000 and T701 manuals for specific information.

Chapter 2

Configuration

Configuration of the LZ520-2D Reader

The LZ520-2D is configured using the setup bar codes found in Appendix A. Most commands are of the single entry type and only require a single command to enable or disable a feature or function. To change the configuration of a setting start by scanning the “Start Setup” bar code followed by the bar code for the setting(s) you wish to change and then the “End Setup” bar code. You will notice that once you read the “Start Setup” bar code the LZ520-2D will enter setup mode and stay on until you scan the “End Setup” bar code.

When scanning setup bar codes (or just about any bar code for that matter) follow these tips for best results:

- 1) Since the LZ520-2D functions like a camera, holding the scanner steady will improve scanning results.
- 2) When more than one bar code is in the visible area of the scanner it is a good idea to cover the “unwanted” bar codes to prevent them from being read by accident.
- 3) If you scan a setup code by accident and the scanner is not working properly but you're not sure what you changed, it's best to scan the “Reset All Settings to Default” bar code and start over.
- 4) You will find that most bar codes read better when the scanner is angled slightly so that the light reflected from the bar code does not “blind” the scanner. It's just like if you were to try to take a flash picture of a piece of paper, when you do it straight on the flash bounces back and you get a lot of glare but if you do it at a slight angle you get a nice picture.
- 5) Reading of high-resolution bar codes may require you to move the scanner closer to the bar code to get a good read.
- 6) When reading a poor quality bar codes it is a good idea to put tighter limits on what the bar code reader will allow to prevent errors in reading.
- 7) The LZ520-2D is an “Omnidirectional” bar code reader so bar codes can be read with any orientation or rotation relative to the reader.

Warning: The setup codes in the LZ520-2D Setup Guide are for the LZ520-2D only. Do not use these codes to setup the 2D scanner on a 2D integrated Terminal or TriCoder. Use the internal menu to configure those units.

1D Codes:

Code Type	Enabled by Default	Additional Setup Info
UPC	yes	page A-4
EAN	yes	page A-5
EAN-13	yes	page A-5
EAN-8	yes	page A-5
Code 39	yes	page A-7
Codabar	yes	page A-8
Code 128	yes	page A-10
Code 93	yes	page A-11
Code 11	no	page A-12
Industrial 2 of 5	yes	page A-13
Interleaved 2 of 5	yes	page A-13
S-Code	yes	page A-13
Matrix 2 of 5	no	page A-13
Chinese Post Matrix 2 of 5	no	page A-13
MSI/Plessey	yes	page A-14
UK/Plessey	yes	page A-15
POSTNET	no	page A-16
Intelligent Mail Bar Code	no	page A-17
GS1 DataBar	yes	page A-18
Korean Postal Authority	no	page A-19
IATA	yes	page A-20
Tri-Optic	yes	page A-21
Telepen	yes	page A-22
JPN (Customer Bar Code)	no	page A-23

2D codes:

Code Type	Enabled by Default	Additional Setup Info
PDF417	yes	page A-24
Micro PDF417	yes	page A-25
Maxi Code	yes	page A-26
QR Code	yes	page A-27
Micro QR	yes	page A-28
Aztec Code	yes	page A-29
Aztec Runes	no	page A-30
Data Matrix (ECC 200)	yes	page A-31
Data Matrix (ECC 000-140)	no	page A-31
Codablock F	no	page A-32
Chinese Sensible Code	no	page A-33
All Codes	no	page A-34

Other Options:

Item	Setup Info
Number of Characters	page A-35
Composite Codes	page A-36
String Options (preamble, postamble)	page A-37
String Options (prefix, suffix)	page A-38
String Options (code identification)	page A-41
Collective Reading	page A-43
Read Mode	page A-45
Imager Settings	page A-49
Indicator Settings	page A-50

Warning: These setup codes are for the LZ520-2D only. Do not use these codes to setup the 2D scanner on a 2D integrated Terminal or TriCoder. Use the internal menu to configure those units.

Note: Use caution when reading setup codes such that unwanted codes are not read.

Set to factory default:

To set the scanner to factory defaults, scan one of the codes below.

Set USB I/F and Reset All Settings to Default



Set RS-232 I/F and Reset All Settings to Default



Note: The RS-232 I/F setting applies to the LZ520-2D when used as an **external** scanner attached to portable devices such as the Terminal and TriCoder.

Warning: These setup codes are for the LZ520-2D only. Do not use these codes to setup the 2D scanner on a 2D integrated Terminal or TriCoder. Use the internal menu to configure those units.

UPC

Start Setup



End Setup



UPC-A Settings:

UPC-A leading zero check digit transmission	UPC-A, no leading zero, transmit check digit	default	
	UPC-A, no leading zero, not transmit check digit		
	UPC-A, leading zero, transmit check digit		
	UPC-A, leading zero, not transmit check digit		

UPC-E Settings:

UPC-E leading zero check digit transmission	UPC-E, no leading zero, transmit check digit	default	
	UPC-E, no leading zero, not transmit check digit		
	UPC-E, leading zero, transmit check digit		
	UPC-E, leading zero, not transmit check digit		
UPC-A,E conversion	transmit UPC-E	default	
	transmit as UPC-A		
UPC-E1 conversion	disable UPC-E1	default	
	enable UPC-E1		

UPC Supplement Settings:

UPC Symbolologies	Exclusive	Enable	Disable
UPC without supplement (default enable)			
UPC with 2-digit supplement			
UPC with 5-digit supplement			

note: setting any symbology to exclusive will disable all other symbologies

EAN

Start Setup



End Setup



EAN Settings:

EAN-13 and EAN-8 Check Digit Transmission	not transmit EAN-13 check digit		
	transmit EAN-13 check digit	default	
	not transmit EAN-8 check digit		
	transmit EAN-8 check digit	default	
EAN-13 and EAN-8 ISBN Conversion	disable ISBN conversion	default	
	enable ISBN conversion		
	enable ISBN if possible		
EAN-13 and EAN-8 ISSN Conversion	disable ISSN conversion	default	
	enable ISSN conversion		
	enable ISSN if possible		
EAN-13 and EAN-8 ISMN Conversion	disable ISMN conversion	default	
	enable ISMN conversion		
	enable ISMN if possible		
EAN-13 Forced Add-On 1	enable EAN forced add-on when EAN13 starts with 378 / 379 / 529		
	disable EAN forced add-on when EAN13 starts with 378 / 379 / 529	default	
EAN-13 Forced Add-On 2	enable EAN forced add-on when EAN13 starts with 434 / 439 / 414 / 419 / 977 / 978		
	disable EAN forced add-on when EAN13 starts with 434 / 439 / 414 / 419 / 977 / 978	default	

EAN Supplement Settings:

EAN Symbologies	Exclusive	Enable	Disable
EAN no supplement (default enable)			
EAN with 2-digit supplement			
EAN with 5-digit supplement			

note: setting any symbology to exclusive will disable all other symbologies

EAN-13 Supplement Settings:

EAN Symbologies	Exclusive	Enable	Disable
EAN-13 no supplement (default enable)			N/A
EAN-13 with 2-digit supplement			N/A
EAN-13 with 5-digit supplement			N/A

note: setting any symbology to exclusive will disable all other symbologies

EAN-8 Supplement Settings:

EAN Symbologies	Exclusive	Enable	Disable
EAN-8 no supplement (default enable)			N/A
EAN-8 with 2-digit supplement			N/A
EAN-8 with 5-digit supplement			N/A

note: setting any symbology to exclusive will disable all other symbologies

Code 39

Start Setup



End Setup



Code 39 Settings:

Code 39	Exclusive	Enable	Disable
Code 39 Enable/Disable (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Full ASCII Conversion	normal code 39	default	
	full ASCII code 39		
	full ASCII code 39 if possible		

Code 39 and It Pharmaceutical Check Digit (CD)	not check CD	default	
	check CD		
	not transmit CD		
	transmit CD	default	

Code 39 and It Pharmaceutical Misc Settings	not transmit start/stop	default	
	transmit start/stop		
	minimum data = three characters		
	minimum data = one character	default	
	disable concatenation	default	
	enable concatenation		

Italian Pharmaceutical Options	Enable	Disable
Italian Pharmaceutical Only (default disable)		
Italian Pharmaceutical if Possible (default disable)		
Leading A Transmission (default disable)		

Codabar

Start Setup



End Setup



Codabar Settings:

Codabar	Exclusive	Enable	Disable
Codabar Enable/Disable (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Codabar ABC, CX Conversion	enable only Codabar normal mode	default	
	enable only ABC code		
	enable only CX code		
	enable Codabar / ABC and CX		

Codabar Check Digit (CD)	not check CD	default	
	check CD		
	not transmit CD		
	transmit CD	default	

Codabar Start / Stop	not transmit start / stop	default	
	start / stop = ABCD / ABCD		
	start / stop = abcd / abcd		
	start / stop = ABCD / TN*E		
	start / stop = abcd / tn*e		
	start = <DC1><DC2><DC3><DC4> stop = <DC1><DC2><DC3><DC4>		

Codabar Settings Continued:

Codabar Minimum Digit	minimum data = one character		
	minimum data = three characters		
	minimum data = five characters	default	

Codabar Space Insertion	disable space insertion	default	
	enable space insertion		

Codabar Inter-Character Gap Check	disable inter-character gap check		
	enable inter-character gap check	default	

Code 128

Start Setup



End Setup



Code 128 Settings:

Codabar	Exclusive	Enable	Disable
Code 128 Enable/Disable (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Code 128 and GS1-128 (EAN-128) EAN-128 Conversion	disable GS1-128	default	
	enable GS1-128 only		
	enable EAN-128 if possible		

Code 128 and GS1-128 (EAN-128) Concatenation	disable concatenation (FNC2 message append)	default	
	enable concatenation (FNC2 message append)		

Code 93

Start Setup



End Setup



Code 93 Settings:

Symbology	Exclusive	Enable	Disable
Code 93 (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Code 93 Check Digit (CD)	not transmit CD	default	
	transmit CD		

Code 11

Start Setup



End Setup



Code 11 Settings:

Symbology	Exclusive	Enable	Disable
Code 11 (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Code 11 Check Digit (CD)	not check CD		
	check 1 CD		
	check 2 CD		
	check auto 1 or 2 CD	default	
	not transmit CD	default	
	transmit CD		

2 of 5 and S-Code

Start Setup



End Setup



2 of 5 and S-Code Settings:

Symbology	Exclusive	Enable	Disable
Industrial 2 of 5 (default enable)			
Interleaved 2 of 5 (default enable)			
S-Code (default enable)			N/A
Matrix 2 of 5 (default disable)			N/A
Chinese Post Matrix 2 of 5 (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

2 of 5 and S-Code Check Digit (CD)	not check CD	default	
	check CD		
	not transmit CD		
	transmit CD	default	

2 of 5 and S-Code Space Check	disable space check for Industrial 2 of 5		
	enable space check for Industrial 2 of 5	default	

S-Code Conversion	not transmit S-Code as Interleaved 2 of 5	default	
	transmit S-Code as Interleaved 2 of 5		

2 of 5 and S-Code Minimum Digit	minimum data = one character		
	minimum data = three characters		
	minimum data = five characters	default	

MSI / Plessey

Start Setup



End Setup



MSI / Plessey Settings:

Symbology	Exclusive	Enable	Disable
MSI / Plessey (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

MSI / Plessey Check Digit (CD)	not check CD		
	check 1 CD = mod 10	default	
	check 2 CD = mod 10/mod 10		
	check 2 CD = mod 10/mod 11		
	check 2 CD = mod 11/mod 10		
	check 2 CD = mod 11/mod 11		

MSI / Plessey Check Digit (CD) Transmission	not transmit CD		
	transmit CD 1	default	
	transmit CD 1 and CD 2		

UK / Plessey

Start Setup



End Setup



UK / Plessey Settings:

Symbology	Exclusive	Enable	Disable
UK / Plessey (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

UK / Plessey Check Digit (CD)	not transmit CD		
	transmit CD	default	

UK / Plessey Space Insertion	disable space insertion	default	
	enable space insertion		

UK / Plessey X Conversion	disable A -> X conversion	default	
	enable A -> X conversion		

POSTNET

Start Setup



End Setup



POSTNET Settings:

Symbology	Exclusive	Enable	Disable
POSTNET (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Intelligent Mail Bar Code



Start Setup



End Setup



Intelligent Mail Bar Code Settings:

Symbology	Exclusive	Enable	Disable
IMBC (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

GS1 DataBar

Start Setup



End Setup



GS1 DataBar Settings:

Symbology	Exclusive	Enable	Disable
GS1 DataBar Omnidirectional Truncated Stacked Stacked Omnidirectional (default enable)			
GS1 DataBar Limited (default enable)			
GS1 DataBar Expanded Expanded Stacked (default enable)			
GS1 DataBar All Above Types (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

GS1 DataBar Check Digit (CD)	not transmit CD		
	transmit CD	default	

GS1 DataBar AI Transmission	not transmit application identifier		
	transmit application identifier	default	

Korean Postal Authority

Start Setup



End Setup



Korean Postal Authority Code Settings:

Symbology	Exclusive	Enable	Disable
Korean Postal Authority (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Korean Postal Authority Check Digit (CD)	not transmit CD	default	
	transmit CD		

Korean Postal Authority Dash	not transmit dash		
	transmit dash	default	

Korean Postal Authority Upside Down Reading	upside down reading enabled		
	upside down reading disabled	default	

IATA

Start Setup



End Setup



IATA Settings:

Symbology	Exclusive	Enable	Disable
IATA (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

IATA Check Digit (CD)	not check CD	default	
	check FC / SN only		
	check FC / CPN / SN		
	check FC / CPN / AC / SN		

IATA Check Digit (CD) Transmission	not transmit CD		
	transmit CD	default	

Tri-Optic



Start Setup



End Setup



Tri-Optic Settings:

Symbology	Exclusive	Enable	Disable
Tri-Optic (default enable)			N/A

note: setting any symbology to exclusive will disable all other symbologies

Telepen

Start Setup



End Setup



Telepen Settings:

Symbology	Exclusive	Enable	Disable
Telepen (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

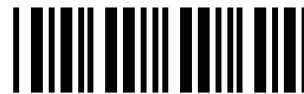
Telepen Conversion Output Mode	numeric mode	default	
	ASCII mode		

JPN (Customer Bar Code)

Start Setup



End Setup



JPN Settings:

Symbology	Exclusive	Enable	Disable
JPN (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

PDF417

Start Setup



End Setup



PDF417 Settings:

Symbology	Exclusive	Enable	Disable
PDF417 (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Micro PDF417

Start Setup



End Setup



Micro PDF417 Settings:

Symbology	Exclusive	Enable	Disable
Micro PDF417 (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Maxi Code

Start Setup



End Setup



Maxi Code Settings:

Symbology	Exclusive	Enable	Disable
Maxi Code (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

QR Code


Start Setup



End Setup



QR Code Settings:

Symbology	Exclusive	Enable	Disable
QR Code (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Micro QR

Start Setup



End Setup



Micro QR Settings:

Symbology	Exclusive	Enable	Disable
Micro QR (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Aztec Code




Start Setup



End Setup



Aztec Code Settings:

Symbology	Exclusive	Enable	Disable
Aztec Code (default enable)			

note: setting any symbology to exclusive will disable all other symbologies

Aztec Runes

Start Setup



End Setup



Aztec Runes Settings:

Symbology	Exclusive	Enable	Disable
Aztec Runes (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Data Matrix







Start Setup



End Setup



Data Matrix Settings:

Symbology	Exclusive	Enable	Disable
Data Matrix (ECC 200) (default enable)			
Data Matrix (ECC 000-140) (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Codablock F

Start Setup



End Setup



Codablock F Settings:

Symbology	Exclusive	Enable	Disable
Codablock F (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Chinese Sensible Code

Start Setup



End Setup



Chinese Sensible Code Settings:

Symbology	Exclusive	Enable	Disable
Chinese Sensible Code (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

All Codes

Start Setup



End Setup



All Codes Settings:

Symbology	Exclusive	Enable	Disable
All 1D Codes (default disable)			
All 2D Codes (default disable)			
All 1D and 2D Codes (default disable)			

note: setting any symbology to exclusive will disable all other symbologies

Use this setting if you're having trouble reading a bar code with the default settings and you don't know what type of code you are trying to read. It's also a quick way to turn On or Off all 1D or 2D code symbologies.

Number of Characters

Start Setup



End Setup



Number of Characters Settings:

If you are going to read bar codes of a known length, it is recommended to set the scanner for a fixed number of characters. The scanner uses this to verify that labels read are of the correct length and reject labels that do not have the specified length. The advantage of setting a fixed length is that it provides protection against short scans of labels, such as Interleaved 2of 5, which do not provide sufficient security against partial scans. The length check is done on the label data and is not affected by options such as (not) transmit start/stop character or check digit. Setting the number of characters does not affect fixed length codes, such as EAN-13. It is also possible to set the minimum and maximum number of characters allowed. The character length settings can be global (applying to all enabled codes) or individual (applying only to selected code types).

Character Length Settings:

Global Setting for Fixed Length	fixed length OFF for all variable length codes	default	
	fixed length ON for all enabled variable length codes		
Individual Setting for Length	fixed length ON for selected variable length code(s)		
	set minimum length for selected variable length code(s)		
	set maximum length for selected variable length codes		

Fixed Length Example Programming Sequence:

- 1) Scan "Start Setup"
- 2) Scan "Fixed Length ON" (global or individual)
- 3) Scan a bar code of the desired length
- 4) Scan another bar code of a second desired length (optional)
- 5) Scan "End Setup"

If you scan "global" fixed length then all enabled codes will be affected. If you scan "individual" fixed length then only the symbology scanned in step 3 and/or 4 is affected.

Note: The maximum number of characters that can be set is 8000.

Composite Codes

Start Setup



End Setup



Composite Codes Settings:

Link Flag	not ignore link flag for RSS/EAN-128 and EAN/UPC	default	
	ignore link flag for RSS/EAN-128 and EAN/UPC		
RSS / EAN-128 Composite	disable RSS/EAN-128 composite	default	
	enable RSS/EAN-128 composite		
EAN / UPC Composite	disable EAN/UPC composite	default	
	enable EAN/UPC composite		
Composite Component	enable 1D composite only		
	enable 2D composite only		
	enable 1D and 2D composites	default	

Outputs for Composite Code Setting:

Composite Setting			Output		
Enable/Disable	Link Flag	Composite Component	1D+2D	1D	2D
Enable	not ignore	N/A	o	x	x
	ignore	1D composite only	o	#	x
		2D composite only	o	x	#
		1D and 2D composite	o	#	#
Disable	N/A	1D composite only	x	o	x
		2D composite only	x	x	o
		1D and 2D composite	x	o	o

o : Priority output

: Output when data cannot be output with o

x : Not output

String Options

Start Setup



End Setup



Case Conversion Settings:

Case Conversion	no case conversion (AbCd -> AbCd)	default	
	convert to upper case (AbCd -> ABCD)		
	convert to lower case (AbCd -> abcd)		
	exchange case (AbCd -> aBcD)		

Output Format Settings:

The following additional characters can be included in each code that is scanned:

1) Preamble / Postamble (up to 8 digits)

Specified strings can be added in front and at the end of the data for all codes.

2) Prefix / Suffix (up to 4 digits)

Specified strings can be added in front and at the end of the data for a specific symbology.
By default, the prefix is empty and the suffix is a CR character.

3) Code Identification / Code Length

Code Identification and Code Length can be included in a prefix and/or a suffix.

Output Format:

Preamble (max 8 digits)	Prefix for each code (max 4 digits)	Data	Suffix for each code (max 4 digits)	Postamble (max 8 digits)
----------------------------	--	------	--	-----------------------------

Preamble and Postamble	preamble command			
	postamble command			

























Preamble / Postamble Example Programming Sequence:

- 1) Scan "Start Setup"
- 2) Scan "Preamble Command" or "Postamble Command"
- 3) Scan up to 8 ASCII values from the ASCII Value Table
- 4) Scan "End Setup"

Prefix / Suffix Commands:

Symbology	Prefix Command	Suffix Command
All Codes		
UPC-A		
UPC-A add-on		
UPC-E		
UPC-E add-on		
EAN-13		
EAN-13 add-on		
EAN-8		
EAN-8 add-on		
Code 39		
Tri-optic		
Codabar		
Industrial 2 of 5		
Interleaved 2 of 5		
S-code		
Matrix 2 of 5		
IATA		
MSI/Plessey		
Telepen		
UK/Plessey		
Code 128		
GS1-128		
Code 11		
Intelligent Mail Bar Code		





































































































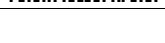
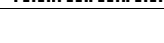
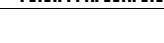
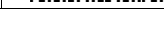
Prefix / Suffix Commands Continued:

Symbology	Prefix Command	Suffix Command
POSTNET		
GS1 DataBar		
Composite code		
Codablock-F		
Data Matrix		
Aztec		
Chinese Sensible Code		
QR Code		
Maxicode		
PDF417		
MicroPDF417		
Clear Prefix / Suffix		

























Prefix / Suffix Example Programming Sequence:

- 1) Scan “Start Setup”
- 2) Scan “Prefix Command” or “Suffix Command” for the desired symbology
- 3) Scan up to 4 ASCII values from the Prefix / Suffix ASCII Value Table
- 4) Scan “End Setup”





Prefix / Suffix ASCII Value Table:

ASCII	Command	ASCII	Command	ASCII	Command	ASCII	Command
<SP>		A		a		(NULL)	
!		B		b		(SOH)	
“		C		c		(STX)	
#		D		d		(ETX)	
\$		E		e		(EOT)	
%		F		f		(ENQ)	
&		G		g		(ACK)	
'		H		h		(BEL)	
(	I		i		(BS)	
)		J		j		(HT)	
*		K		k		(LF)	
+		L		l		(VT)	
,		M		m		(FF)	
-		N		n		(CR)	
.		O		o		(SO)	
/		P		p		(SI)	
:		Q		q		(DLE)	
;		R		r		(DC1)	
<		S		s		(DC2)	
=		T		t		(DC3)	
>		U		u		(DC4)	
?		V		v		(NAK)	
@		W		w		(SYN)	
[	X		x		(ETB)	
\		Y		y		(CAN)	
]		Z		z		(EM)	

Prefix / Suffix ASCII Value Table Continued:

ASCII	Command	ASCII	Command	ASCII	Command	ASCII	Command
^		0				(SUB)	
—		1				(ESC)	
`		2				(FS)	
{		3				(GS)	
		4				(RS)	
}		5				(US)	
~		6				DEL	
		7					
		8					
		9					

Code Identification / Length Settings:

Code Identification	code identification using Worth Data Code ID	
	code identification using AIM/ISO/IEC 15424 ID	
Code Length	code length (1D/2D : 2/6 digit)	
	code length (1D/2D : 6/6 digit)	

Code Identification and Code Length can be included in a prefix and/or suffix. The code length will be the number of characters that is configured above. The code identification and code length can be put at any position in the prefix/suffix string. These direct input characters count as 1 entry of the 4 permissible entries for a prefix and suffix.

The code length is transmitted as 2 digits, excluding prefix and suffix characters. For 2D codes the code length is transmitted as 6 digits. It is also possible to send the length as 6 digits for both 1D and 2D codes.

Worth Data Code ID Prefix / Suffix Values:

Code	Code ID	Code	Code ID
UPC-A	C	MSI/Plessey	Z
UPC-A +2	F	Telepen	d
UPC-A +5	G	UK/Plessey	a
UPC-E	D	Code 128	T
UPC-E +2	H	GS1-128	T
UPC-E +5	I	Code 93	U
EAN-13	B	Code 11	b
EAN-13 +2	L	Korean Postal Authority	c
EAN-13 +5	M	Intelligent Mail Bar Code	0
EAN-8	A	POSTNET	3
EAN-8 +2	J	GS1 DataBar	y
EAN-8 +5	K	Composite Code-A	m
Code 39	V	Composite Code-B	n
Code 39 Full ASCII	W	Composite Code-C	l
Italian Pharmaceutical	Y	Codablock-F	E
Codabar	R	DataMatrix	t
Codabar ABC	S	Aztec	o
Codabar CX	f	Aztec Runes	o
Industrial 2 of 5	O	Chinese Sensible Code	e
Interleaved 2 of 5	N	QR Code	u
S-Code	g	Micro QR Code	j
Matrix 2 of 5	Q	Maxi Code	v
Chinese Post	w	PDF417	r
IATA	P	Micro PDF417	s

Collective Reading

Start Setup



End Setup



Collective Reading Settings:

It is possible to not output data unless the specified number of codes is read. That means that the scanner does not read codes other than the specified number. Use this setting to read a group of labels all at once.



Multiple Label Read	multiple label = 1	default	
	multiple label = 2		
	multiple label = 3		
	multiple label = 4		
	multiple label = 5		
	multiple label = 6		
	multiple label = 7		
	multiple label = 8		
	multiple label = 9		
	multiple label = 10		



Multiple Label Read (right and left)	left to right	default	
	right to left		




Multiple Label Read (top and bottom)	top to bottom	default	
	bottom to top		

Multiple Label Read (output priority)	output priority vertical	default	
	output priority horizontal		

Collective Reading Settings Continued:

Same Label Read	disable same label read during multiple read	default	
	enable same label read during multiple read		

Sorting Labels	enable sorting decoded labels	default	
	disable sorting decoded labels		

Buffered Mode	buffered mode (one image)	default	
	buffered mode (multiple images)		
	non-buffered mode		

Read Mode

Start Setup



End Setup



Read Mode Settings:



Read Mode	single read	default	
	multiple read (see below)		
	continuous read (used mainly for demonstration)		



In multiple read mode, when a bar code has been decoded, the decoded data will be output and the scan engine will keep on reading. When the bar code that has just been output is read again, it will not be output. However, when the scanner cannot decode any labels for some configurable time, it will forget the previous scan and then the same label can be read again.

Multiple Read Reset Time	multiple read reset time = 1 frame		
	multiple read reset time = 2 frames		
	multiple read reset time = 3 frames		
	multiple read reset time = 4 frames		
	multiple read reset time = 5 frames		
	multiple read reset time = 6 frames	default	
	multiple read reset time = 7 frames		
	multiple read reset time = indefinitely		












Enable/Disable Trigger	enable trigger	default	
	disable trigger (continuous read)		




Read Mode Settings Continued:

Auto Trigger (Stand Mode)	enable auto trigger		
	disable auto trigger	default	













Auto Trigger Synchronization	disable auto trigger synchronization		
	enable auto trigger synchronization	default	










note: when the auto trigger is synchronized with the trigger switch, the read time configured for normal reading will be used for auto trigger read time.

Auto Trigger Read Time	read time 1 second	default	
	read time 2 seconds		
	read time 3 seconds		
	read time 4 seconds		
	read time 5 seconds		
	read time 6 seconds		
	read time 7 seconds		
	read time 8 seconds		
	read time 9 seconds		
	read time * 10		
	read time indefinitely		




Auto Trigger Conditions	auto trigger = sensitive	default	
	auto trigger = normal		
	auto trigger = insensitive		

Read Mode Settings Continued:





Normal Read Time	read time 0 second		
	read time 1 second		
	read time 2 seconds	default	
	read time 3 seconds		
	read time 4 seconds		
	read time 5 seconds		
	read time 6 seconds		
	read time 7 seconds		
	read time 8 seconds		
	read time 9 seconds		
	read time * 10		
	read time indefinitely		

Redundancy	read 1 time, redundancy = 0		
	read 2 time, redundancy = 1	default	
	read 3 time, redundancy = 2		
	read 4 time, redundancy = 3		
	read 5 time, redundancy = 4		
	read 6 time, redundancy = 5		
	read 7 time, redundancy = 6		
	read 8 time, redundancy = 7		
	read 9 time, redundancy = 8		









Redundancy is the number of times that the label has to be scanned in addition to the first scan.











Positive and Negative Codes	positive bar codes (black on white)	default	
	negative bar codes (white on black)		
	positive and negative bar codes		

Read Mode Settings Continued:




Add-on Delay Timer	disable add-on wait more	default	
	add-on wait mode = 0.25 seconds		
	add-on wait mode = 0.50 seconds		
	add-on wait mode = 0.75 seconds		




Since WPC-type codes (UPC, EAN) with add-on (supplements) have a high probability of unsuccessful decoding, the scanner repeats decoding the add-on code during the specified period of time. It is effective to read the add-on parts, but it will also cause a reduced response when a code without an add-on is read.



Margin Check (Quiet Zone)	no margin check		
	margin check 1/7 normal		
	margin check 2/7 normal		
	margin check 3/7 normal		
	margin check 4/7 normal		
	margin check 5/7 normal		
	margin check 6/7 normal		
	margin check normal	default	





Power Saving	disable power saving (USB I/F default)	default	
	power saving after 0 seconds (RS-232 I/F default)	default	
	power saving after 1 second		
	power saving after 2 seconds		
	power saving after 5 seconds		
	power saving after 10 seconds		
	power saving after 30 seconds		
	power saving after 10 minutes		
	power saving after 30 minutes		
	power saving after 60 minutes		



Imager Settings:




Illumination Mode	disable LED illumination		
	enable LED illumination	default	
	LED illumination alternating		

Aiming On/Off	disable laser aiming and LED illumination		
	enable laser aiming	default	
	disable laser aiming		




Central Reading	enable central reading (read only a code that the laser aims at)		
	disable central reading (read the entire image)	default	

1D Code Decode Mode	careful mode (good for hard to read codes)		
	standard mode	default	
	semi-quick mode		
	quick mode (good for easy to read codes)		

LCD Display Scanning	disable scanning from LCD display	default	
	enable scanning from LCD display		

Auto Focus Mode	AF system = laser and contrast	default	
	AF system = contrast only		
	AF system = laser only		

Note: Normally laser ranging is used for reading labels. In case it cannot be used in a brightly-lit environment, the contrast method is used. When “contrast only” is configured, the reading speed will be slower.

Fixed Focus Mode	short range = 90mm		
	medium range = 163mm		
	long range = 880mm		

Indicator Settings

Start Setup



End Setup



Buzzer	enable good read buzzer	default	
	disable good read buzzer		
Buzzer Tone	single tone buzzer	default	
	high-low buzzer		
	low-high buzzer		
Buzzer Duration	buzzer duration = 50ms	default	
	buzzer duration = 100ms		
	buzzer duration = 200ms		
	buzzer duration = 400ms		
Buzzer Loudness	buzzer loudness = maximum	default	
	buzzer loudness = high		
	buzzer loudness = medium		
	buzzer loudness = low		
Buzzer Transmission	buzzer before transmission	default	
	buzzer after transmission		
Startup Buzzer	enable startup buzzer	default	
	disable startup buzzer		
Good Read LED	disable LED		
	LED duration = 0.2 seconds	default	
	LED duration = 0.4 seconds		
	LED duration = 0.8 seconds		

Diagnostics

Start Setup



End Setup



Diagnostic Codes:

Diagnostics	Transmit software version	
	Transmit settings	
	Transmit only changes from default	
	Transmit ASCII printable string	
	Transmit ASCII control string	
	Reset to default (RS-232)	
	Reset to default (USB-HID)	

Appendix B

Resolving USB Installation Issues

The USB HID (Human Interface Device) keyboard driver is standard with Windows®. Most recent versions of Windows include necessary files in the installed Windows system folders so driver installation is easy if not automatic. It is possible for the user to cancel the HID driver installation before it is completed and this results in a problem. Restarting Windows does NOT initiate a re-installation; the user must go into the device management utility in Windows. Location and operation of the device management utility is different depending on the version of Windows:

Windows® XP:

1. Go to the **Start** menu.
2. Select **Control Panel**.
3. Switch to **Classic View** if you are in **Category View**
4. Select **System**.
5. Select **Hardware** tab.
6. Select **Device Manager**
7. Double Click on **Human Interface Devices**
8. Locate the USB Human Interface Device with a ! in the icon.
9. Click on **Update Driver**
10. Follow instructions.

If XP fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows XP CD-ROM to complete the installation. Also make sure you have rights to add new hardware to your computer - some

XP installations problems can be solved by logging in as the **Administrator** of the computer.

11. Click **Finish**

Windows® 98SE & ME:

1. Go to the **Start** menu.
2. Go to **Settings**.
3. Select **Control Panel**.
4. Go to **System**.
5. Click on the **Device Manager** tab.
6. Double Click on the **USB Human Interface Devices**
7. Click on the **Reinstall Driver** button.
8. Follow directions.

If the installer cannot find the right driver file on your hard disk, you may have to insert the original Windows® 98SE or ME CDROM and point to it to complete the installation.

9. Click **Finish**.

Windows® 2000:

1. Log on as **Administrator** and open the **Administrative Tools** folder in your **Control Panel**.
2. Run the **Computer Management** utility.
3. Select the **Tree** tab on the left panel
4. Find the **Device Manager** entry under **System Tools** and click on it. The right panel will display current devices.
5. Problem devices will be identified with an ! icon. Find either the **HID Keyboard Device** under **Keyboards** or the **USB Human Interface Device** under **Human Interface Devices** and double-click on one of those entries.
6. Select the **Driver** tab at the top of the window and click on the **Update Driver** button. Follow the prompts to re-install the HID driver.

Windows 7 & Vista:

1. Go to the **Start menu**.
2. Select **Control Panel**.
3. Switch to **Classic View** if you are in **Category View**
4. Select **System**.
5. Select **Hardware** tab.
6. Select **Device Manager**
7. Double Click on **Human Interface Devices**
8. Locate the USB Human Interface Device with a ! in the icon.
9. Click on **Update Driver**
10. Follow instructions.

If Windows 7 or Vista fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows 7 or Vista CD-ROM to complete the installation. Also make sure you have rights to add new hardware to your computer - many Windows 7 or Vista installations problems can be solved by logging in as the **Administrator** of the computer. In order to install new hardware in Windows 7 or Vista you may need to turn off the **UAC** (UserAccount Control). **UAC** is turned off using the **User Account** icon. **UAC** is turned on using the **Security Center** icon.